Five-Year Review Report

Second Five-Year Review Report
for
Skinner Landfill Superfund Site
Butler County
West Chester, Ohio

March 2004

PREPARED BY:

United States Environmental Protection Agency
Region 5
Chicago, Illinois

Approved by:

for Richard C. Karl, Acting Director
Superfund Division

Date:

3/17/04

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Attachments

List of Acronyms

ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EPA	United States Environmental Protection Agency
CFR	Code of Federal Regulations
DNAPL	Dense Non-aqueous Phase Liquid
FML	Flexible Membrane Liner
GCL	Geosynthetic Clay Liner
GIS	Groundwater Interception System
HDPE	High Density Polyethylene
LNAPL	Light Non-aqueous Phase Liquid
MCL	Maximum Contaminant Level
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
PCB	Polychlorinated Biphenyl
PRP	Potentially Responsible Party
RA	Remedial Action
RAO	Remedial Action Objective
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SVE	Soil Vapor Extraction
VOC	Volatile Organic Compound

Executive Summary

The five-year review of the Skinner Landfill site in West Chester, Ohio was completed in March 2004. The remedy is protective of human health and the environment in the short term. There are no current exposure pathways and the remedy appears to be functioning as designed. The landfill cap, the GIS and putting citizens on public water supply eliminates the source of contamination and has achieved the remedial objectives to minimize the migration of contaminants to groundwater and surface water and prevent direct contact with, or ingestion of, contaminants in soils and sediments. A few deficiencies that do not immediately impact the protectiveness of the remedy were noted.

Both the Health and Safety Plan and the Contingency Plans are in place, sufficient to control risks, and properly implemented. The remedy for the Skinner Landfill Superfund Site (the site) includes a landfill cap/containment, access controls, institutional controls and a groundwater interception system (GIS).

The Ohio Environmental Protection Agency (Ohio EPA) in cooperation with the United States Environmental Protection Agency (EPA) completed oversight of all major construction activities for the site.

The site is located approximately 15 miles north of Cincinnati, Ohio near West Chester, Butler County, Ohio in Township 3, Section 22, Range 2. The site is comprised of approximately 78 acres of hilly terrain. The site was used in the past for the mining of sand and gravel, and was operated for the landfilling of a wide variety of materials from approximately 1934 through 1990. Materials deposited at the site include demolition debris, household refuse, and a variety of chemical wastes. The site is bordered on the east by a Norfolk Southern Railway Company right-of-way, on the south by the East Fork of Mill Creek, on the north by wooded and agricultural land, and on the west by a gravel driveway and Cincinnati-Dayton Road.

The site achieved construction completion in September 2001. The assessment of this five-year review found that the remedy was constructed in accordance with the requirements of the June 4, 1993, Record of Decision (ROD). The remedy is protective of human health and the environment in the short term and there are no current exposure pathways and the remedy appears to be functioning as designed. The landfill cap has been constructed over all the wastes, a GIS is operating, and a public water supply was provided to nearby residents.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name *(from WasteLAN)*: Skinner Landfill		
EPA ID *(from WasteLAN)*: OHD063963714		
Region: V	**State:** Ohio	**City/County:** West Chester/Butler

SITE STATUS	
NPL status: ✖ Final ☐ Deleted ☐ Other (specify)	
Remediation status (choose all that apply): ☐ Under Construction ✖ Operating ☐ Complete	
Multiple OUs? YES X NO	**Construction completion date:** 9-27-01
Has site been put into reuse? ☐ YES ✖ NO	

REVIEW STATUS	
Reviewing agency: ✖ EPA X State ☐ Tribe ☐ Other Federal Agency	
Author name: Scott Hansen	
Author title: Remedial Project Manager	**Author affiliation:** EPA Region V
Review period: 2/17/2004 - 3/17/2004	
Date(s) of site inspection: 1/22/2004	
Type of review: ✖ Statutory ☐ Policy (☐ Post-SARA ☐ Pre-Sara ☐ NPL-Removal only ☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead ☐ Regional Discretion)	
Review number: ☐ 1(first) X 2 (second) ☐ 3 (third) ☐ Other (specify)	
Triggering action: Actual RA Onsite Construction at OU # ___ ☐ Actual RA Start at OU# ___ ☐ Construction Completion X Previous Five-Year Review Report ☐ Other (specify)	
Triggering action date *(from WasteLAN)*: 3/17/1999	
Due date *(five years after triggering action date)*: 3/17/2004	

Five-Year Review Summary Form, cont'd.

Issue:

1) Institutional controls need to be implemented.

2) The creek bank on the East Fork of Mill Creek, southeast side of the site, has eroded.

3) The site fence needs to be installed where the creek bank has eroded.

4) Water is accumulating in Vault Box and Inspection Manhole.

5) Decide if upgradient groundwater control is required.

6) Security measures required.

Recommendations and Follow-up Actions:

1) Institutional controls will be implemented.

2) The creek bank will be stabilized (e.g. rip-rap, gabion wall, sheet-piling.).

3) Once the creek bank is stabilized the site fence will be installed.

4) Water will be pumped out of Vault Box and Inspection Manhole periodically.

5) Continue to monitor the elevation of the groundwater beneath the landfill cap area.

6) Make sure that site fence is in place and look for signs of trespassing.

Protectiveness Statement(s):

The remedy is protective of human health and the environment in the short term. There are no current exposure pathways and the remedy appears to be functioning as designed. The landfill cap and putting citizens on public water supply eliminates the source of contamination and has achieved the remedial objectives to minimize the migration of contaminants to groundwater and surface water and prevent direct contact with, or ingestion of, contaminants in soils and sediments. Long-term protectiveness of the of the remedial action will be achieved when cleanup goals are met.

Other Comments:

At this time, the institutional controls portion of the remedy has not been implemented. There has been a dispute over who will be the grantee of the institutional controls.

SKINNER LANDFILL SITE
WEST CHESTER, OHIO
FIVE YEAR REVIEW REPORT

I. INTRODUCTION

The purpose of the five-year review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and identify recommendations to address them.

EPA is preparing this Five-Year Review report pursuant to CERCLA §121 and the National Contingency Plan (NCP). CERCLA §121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgement of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

EPA interpreted this requirement further in the NCP; 40 CFR §300.430(f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

EPA, Region 5, is conducting this five-year review of the remedy implemented at the Skinner Landfill Superfund Site in West Chester, Ohio. This review was conducted by the Remedial Project Manager (RPM) for the site. This report documents the results of the review.

The triggering action for this statutory review is the previous five-year review which was completed on March 17, 1999. The five-year review is required due to the fact that hazardous substances, pollutants, or contaminants remain at the site at levels which do not allow for unlimited use and unrestricted exposure.

II. SITE CHRONOLOGY

Table 1 - Chronology of Site Events

EVENT	*DATE*
Initial Discovery of Problem	1976
Proposed on NPL	December 30, 1982
Listed on NPL	September 8, 1983
RI/FS (entire site)	September 26, 1984 - June 4, 1993
Interim ROD	September 30, 1992
Unilateral Administrative Order	December 9, 1992
ROD (entire site)	June 4, 1993
RD	March 29, 1994 - June 18, 1996
RA Start	June 18, 1996
First Five-Year Review	March 1999
RA Construction Start	April 2, 2001
RA Completed	September 30, 2003
Final Inspection of Entire Site	March 27, 2003
PCOR	September 27, 2001
O&M Activities Began	June 30, 2003
Next Five-Year Review	March 2009

III. BACKGROUND

Physical Characteristics

The site is located approximately 15 miles north of Cincinnati, Ohio near West Chester, Butler County, Ohio in Township 3, Section 22, Range 2. The site is bordered on the east by a Norfolk Southern Railway Company right-of-way, on the south by the East Fork of Mill Creek, on the north by wooded and agricultural land, and on the west by a gravel driveway and Cincinnati-Dayton Road. A map of the site is provided in Attachment 1.

The approximately 10.5 acre landfill site is fenced on all sides with locked access gates on the south and west sides of the site The only structures on site are the metal electrical box located near the south entrance gate and the gas vents. A gravel access road is located inside the fence on the south and west sides of the site.

The site is located in a highly dissected area that slopes from a till-mantled-bedrock upland to a broad, flat-bottomed valley that is occupied by the main branch of Mill Creek. Elevations on the site range from a high of nearly 800 feet above mean sea level (MSL) in the northeast, to a low of 645 feet above MSL near the confluence of Skinner Creek and the East Fork of Mill Creek. Both Skinner Creek and the East Fork of Mill Creek are small, intermittent shallow streams. Both of these streams flow to the southwest from the site toward Mill Creek, which in turn flows into the Ohio River.

In general, the site is underlain by relatively thin glacial drift over inter-bedded shale and limestone of Ordovician age. The composition of the glacial drift ranges from intermixed silt, sand and gravel, to silty sandy clays with a thickness ranging from zero to over forty feet. The sand and gravel deposits comprise the hills and ridges and are encountered near the surface of the central portion of the site. The silts and clays usually occur as lenses in the sands and gravel or directly overlie bedrock.

Land and Resource Use

The property was originally developed as a sand and gravel mining operation and was subsequently used as a landfill from 1934 to 1990.

History of Contamination

In 1976, in response to a fire on the site and reports of observations of a black, oily liquid in a waste lagoon on the site, the Ohio EPA began an investigation of the site. Before Ohio EPA could complete the investigation, the site owner/operator covered the waste lagoon with a layer of demolition debris, thereby hindering the investigation. Albert Skinner, the site owner at the time, dissuaded the Ohio EPA from accessing the lagoon area by claiming that nerve gas, mustard gas, incendiary bombs, phosphorus, flame throwers, cyanide ash, and other explosive devices were buried at the landfill. This prompted Ohio EPA to request the assistance of the U.S.

Army. Albert Skinner, in the presence of Ohio EPA attorneys and the U.S. Army investigators, subsequently retracted his claims of the presence of ordnance. The U.S. Army and Ohio EPA then dug several trenches into the buried waste lagoon, and found black and orange liquids and a number of barrels of waste. Subsequently, records searches have been performed by the U.S. Army, and have indicated that there is no evidence of munitions of any sort having been disposed at the site.

Based on the initial studies, materials deposited at the site include demolition debris, household refuse and a wide variety of chemical wastes. The waste disposal areas include a now buried former waste lagoon near the center of the site and a landfill. The buried lagoon was used for the disposal of paint wastes, ink wastes, creosote, pesticides, and other chemicals. The landfill area, located north and northeast of the buried lagoon, received predominantly demolition debris.

Initial Response

In 1982, the EPA conducted a limited investigation of the site for the purpose of scoring the site for inclusion on the NPL. The investigation showed that groundwater southeast of the buried waste lagoon was contaminated with VOCs. The site was proposed for the NPL in December 1982.

The EPA completed a search for potentially responsible parties (PRPs) in April 1983. The results of that search were later supplemented by information requests under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 104(e) and by administrative depositions.

In 1986, the U.S. EPA began a Phase I Remedial Investigation (RI), with the sampling of groundwater, surface water, and soils. A biological survey of the East Fork of Mill Creek and Skinner Creek was also performed.

In 1989, the U.S. EPA began its Phase II RI, to further investigate the site groundwater, surface water, soils, and sediments. Overall, more than 400 samples from the site were analyzed.

In August 1990, through a legal proceeding, the Ohio EPA closed the site to all further landfilling activities.

The Phase II RI was completed in May 1991. Both a Baseline Risk Assessment and Feasibility Study (FS) were completed in 1992.

The results of the two-phased RI are summarized below.

The former dump area was used for the disposal of a variety of wastes, including demolition debris, household refuse and assorted scrap. Chemical wastes were also disposed in this area. The total volume of wastes within the former dump was estimated at 120,000 cubic yards. Water samples collected during the Phase I RI indicated that the most concentrated groundwater

contamination found at the site was in the area beneath the former dump. Site records and deposition testimony of waste haulers indicated that large quantities of chemical wastes were disposed in the waste lagoon. These wastes included creosote, paint wastes, ink wastes, and pesticides. The total volume of contaminated materials in the lagoon were estimated in the RI/FS to be 107,000 cubic yards. The total volume of lagoon waste materials that exceeded the risk-based protective levels was estimated in the FS to be 17,000 cubic yards.

Basis for Taking Action

Contaminants

Hazardous substances that have been released at the site in each media include:

Soil	Groundwater
Toluene	Benzene
Xylenes	Ethylbenzene
Ethylbenzene	Xylenes
1,1,2-Trichloroethane	Phenol
1,2-Dichloropropane	2-Methyl phenol
Benzene	4-Methyl phenol
Naphthalene	Acetone
2-Methylnaphthalene	1,2-Dichloroethane
Phenanthrene	Chlorobenzene
Bis(2-ethylhexyl)phthalate	2-Hexanone
Benzoic acid	Methylene chloride
Fluoranthene	Toluene
Pyrene	1,1,2,2-Tetrachloroethylene
Hexachlorobenzene	1,1,2-Trichloroethane
Flourene	1,1-Dichloroethane
Phenol	1,2-Dichloroethane
Butylbenzylphthalate	1,2-Dichloroethene
1,3-Dichlorobenzene	1,2-Dichloropropane
1,4-Dichlorobenzene	Chloroethane
Hexachlorobutadiene	Chloroform
Acenaphthene	Trichloroethene
Benzo(a)anthracene	Vinyl Chloride
Chrysene	1,3-Dichlorobenzene
Hexachlorocyclopentadiene	1,4-Dichlorobenzene
Heptachlor	Benzoic acid
Endrin ketone	Bis(chloroethyl)ether
Gamma Chlordane	Naphthalene
Antimony	
Cadmium	
Lead	

Silver
Thallium

Leachate
Benzene
Chloroethane
1,1-Dichloroethane
Bis(2-chloroethyl)ether
Hexachlorobutadiene

Exposure to soil and groundwater is associated with significant human health risks due to exceedances of EPA's risk criteria for the reasonable maximum exposure scenarios. The carcinogenic risks were highest for exposure to contaminated groundwater from a possible future ingestion pathway. Soil contaminants posed the greatest non-carcinogenic risk to human health through dermal contact and ingestion by children and future workers.

IV. REMEDIAL ACTIONS

Remedy Selection

EPA organized the remedial action at the site into two phases, or "operable units." The first operable unit was an interim action to protect human health from any potential immediate risks. The ROD for the first Operable Unit Interim Action was signed on September 30, 1992. A Unilateral Administrative Order (UAO) for the first operable unit, which included site fencing, connections to the Butler County public water system for potentially affected local users of groundwater, and groundwater monitoring, was issued to the PRPs on December 9, 1992. Several PRPs complied with the UAO.

The ROD for the second and final operable unit was signed on June 4, 1993. The final operable unit addressed potential future migration of site contaminants into groundwater and limited direct exposure to site contaminants to humans through source control measures. The remedial action addressed the source of the contamination by intercepting and treating on-site groundwater. The function of this action is to control the landfill site as a source of groundwater contamination, to reduce the risks associated with the site and reduce exposure to contaminated materials, and to prevent untreated leachate from running off site. The groundwater response action includes long-term monitoring with site-specific groundwater trigger levels. If site-specific groundwater trigger levels are exceeded in downgradient groundwater monitoring wells, EPA will consider whether additional remedial actions are necessary to address groundwater conditions. The ROD also required an investigation to determine the feasibility for soil vapor extraction (SVE) in the granular soil adjacent to the buried lagoon.

The major components of the selected remedy included:

- Construction of a RCRA cap over the waste materials;

- Interception, collection, and treatment of contaminated groundwater;
- Diversion of upgradient groundwater flow, if necessary;
- Monitoring;
- Institutional controls; and
- Soil vapor extraction.

Remedy Implementation

A Remedial Design (RD) Investigation was performed in 1994 to collect data required to assess the feasibility of the SVE and to design the multi-media cap and the groundwater extraction/treatment system. Based on the RD investigation, the installation of a SVE system was determined to be infeasible.

The Remedial Action Consent Decree for the final operable unit was entered by the court on April 2, 2001. The PRP group constructed the landfill cap and the GIS under the requirements of the CD. Construction began in April 2001.

Landfill Cap

The general profile of the cap from top down includes vegetative cover materials, geocomposite drainage layer, flexible geomembrane liner (FML) primary barrier layer, geosynthetic clay liner (GCL) secondary barrier layer, geocomposite gas venting layer and the prepared subgrade.

Site preparation included clearing and grubbing, preparing the GIS working platform, and removing portions of the fence. The on-site borrow material was used to construct the south sidehill fill area and the landfill cap subgrade. The fill material was transported to the application areas by off-road dump trucks and applied to fill areas in lifts with a dozer. The grade was maintained by using a laser and grade rod and staking grade levels in a grid layout. The grade was spot checked with the grade rod throughout the application process and verified after completion by surveyors. Each section of subgrade was inspected by the Construction Quality Assurance (CQA) consultant and the liner subcontractor to verify that the subgrade was acceptable for placement of the geomembrane panels.

The first geosynthetic layer above the subgrade is a geocomposite consisting of a HDPE geonet with a 6-ounce non woven geotextile heat bonded on both sides. The geocomposite layer is used for collecting landfill gas and was incorporated with gas vent stubs, which allowed for ease of attachment of the gas vents prior to the installation of the overlying cap layers. The geocomposite was installed manually by the geosynthetic installation contractor. Deployment generally proceeded from a higher elevation to a lower elevation to minimize wrinkles. The geonet was overlapped at least four inches and affixed together with plastic ties with the geotextile sewn together with hand-held sewing machines.

The secondary barrier layer, a Geosynthetic Clay Liner (GCL), serves as a backup barrier for the primary barrier. The GCL consists of a 0.75 pound per square foot bentonite clay layer bonded

to a non-woven geotextile backing. The GCL was unrolled and pulled into place and overlapped at least six inches edge to edge and, two feet end to end. Installation of the GCL was conducted in a manner that provided immediate coverage of the GCL by the Flexible Membrane Liner (FML) at the end of each working day to prevent hydration of the GCL.

The primary barrier of the landfill cap, the FML, consists of a 60 ml thick low linear density polyethylene FML textured on both sides. The FML was placed directly on top of the GCL immediately following deployment of the GCL. Placement and seaming of the FML was completed in a timely fashion to minimize weather exposure to the GCL. Field seaming the FML panels was the most critical phase of the landfill cap construction and required the most rigorous CQA documentation activities. All major seaming was performed using double-tracked fusion welders. Where fusion welding was not possible, such as joints and around gas vents and piezometers, an extrusion weld was used. Both fusion and extrusion welds were tested by non-destructive test methods to ensure a completed seal.

After sections of the FML were accepted, the drainage layer was installed over the FML to serve two purposes: 1) the geonet facilitates drainage of water that infiltrates through the vegetative cover materials, and 2) the geocomposite affords protection for the liner system during placement of the vegetative cover materials. The drainage layer is a geocomposite consisting of an HDPE geonet with a 6-ounce non-woven geotextile heat bonded to both sides (similar material as the geocomposite gas venting layer).

A minimum of 24 inches of soil was placed over the geosynthetic materials. An excavator was used to cast material out ahead of the leading edge of the cap soil so that no wrinkling developed in the liner/drainage system materials. The cap soil was then pushed with a low ground pressure (LGP) dozer over the in-place drainage layer. Grade was maintained using PVC tubes as grade stakes, so as not to harm the underlying liner materials. No LGP equipment was allowed to be on top of the cap material without a minimum thickness of 18 inches of soil. A minimum of 3 feet was required to be beneath the excavator and dump trucks. To accomplish the minimum thickness requirements, temporary haul roads were installed to enable access to the location where filling occurred. After the application of the cap soil layer was complete, seeding and fertilizing was conducted with a hydro-seeder. Erosion matting was used on slopes, affixed in place with aluminum hooks, to help hold the seed in place.

Surface water drainage control is achieved for the site through the construction of a network of interceptor ditches, drainage letdowns, and culverts. The purpose of the controls is to manage surface water infiltration into the landfill, minimize landfill surface erosion, and direct infiltration away from known disposal areas.

Ten gas probes were constructed around the perimeter of the landfill to monitor landfill gas migration.

Groundwater Interception System

The Groundwater Interception System (GIS) was installed to intercept and capture groundwater migrating from the landfill to the East Fork of Mill Creek. The GIS consists of a of a single cut-off wall of soil-bentonite keyed into bedrock, three gravel filled trenches each with a single groundwater extraction well and a force main system to convey the groundwater to the local sanitary sewer system.

The cut-off wall consists of a soil-bentonite slurry mixture and is capped with native clay to provide protection and a surface for site access. The wall extends from two to three feet below the ground surface (bgs) to where it is keyed into the bedrock. The cut-off wall was constructed by excavating a trench using an extended boom excavator equipped with a 24-inch wide bucket with ripping teeth. The trench was constructed by excavating to bedrock (ranging from approximately 10 feet to 30 feet below grade) and placing the trench spoils to the side. Bentonite clay and water was mixed to create a slurry in a self-contained mixing plant. The bentonite slurry was mixed with the trench spoils to create a soil-bentonite slurry backfill. The bentonite slurry and trench spoils were mixed alongside the trench on the up-gradient side. The majority of the trench spoils were reincorporated into the cut-off wall, with excess soils being used as subgrade for the landfill cap.

The interceptor trench was installed in three separate sections between the landfill and the cut-off wall to create a vertical zone of high permeability gravel extending from two to three feet bgs to approximately four or five feet below the lowest significant sand/gravel seam. The interceptor trenches were generally installed parallel to the cut-off wall. Each trench was excavated to the specified depth (ranging from 14 to 23 feet below grade) prior to placement of geotextile filter fabric along the bottom and sides of the trench. The geotextile fabric was overlapped four feet lengthwise to ensure complete coverage of the trench. The purpose of the geotextile is to filter out fines from the groundwater that may clog the gravel and pumps.

A bio-polymer slurry was placed in the trench bottom prior to placing the geotextile and backfilling to ensure sidewall integrity of the excavation. The slurry allowed for the placement of the geotextile, the granular material and the observation well components. As backfill was placed, extraction and observation wells were installed in accordance with the design specifications. The groundwater extraction pumps were installed in the extraction well of each interceptor trench. The pumps consist of 4" diameter submersibles rated at 25 gpm at 55 feet of total dynamic head. The pumps discharge via a pitless adapter approximately 3 feet bgs. The discharge is transported through a vertical discharge line that is connected to the force main. The force main consists of a 2 inch diameter HDPE pipe approximately 30 inches bgs extending from Extraction Well #1 to the Gravity Manhole. The PRP group has a permit with Butler County Department of Environmental Services to discharge groundwater to the Butler County sewer system.

Other Issues

Two contaminated soil areas located outside the landfill area, but within the limits of the site, Area BP01/BP02 and Area GW-38, were excavated and moved to the on-site landfill and incorporated under the landfill cap. After excavation of the areas, confirmation soil samples were collected and analyzed from each location to ensure that all the contaminated soil was excavated.

Monitoring wells and piezometers were installed in and around the landfill to: 1) monitor the groundwater elevation under the cap to determine contact with buried waste, and 2) assess the long-term performance of the groundwater interception system (interception trench and cut-off wall) in accordance with the Long Term Performance Plan (O&M). Nine new groundwater monitoring wells and one replacement groundwater well were installed during the RA construction activities. Twelve piezometers were installed, four of which are installed through the landfill cap in order to monitor the groundwater/waste contact status.

The remedy also includes physical access restriction with a six-foot high fence with barbed wire at the top, around the entire site sufficient to prevent the public from easily entering the site. The fence is posted with numerous visible warning signs to inform the public of potential site hazards.

A public water supply was supplied to nearby residences located southwest of the site in order to eliminate the groundwater exposure pathway to those persons consuming groundwater.

The site achieved construction completion in September 2001. A Preliminary Close Out Report (PCOR) was completed on September 27, 2001.

System Operations/Operation and Maintenance (O&M)

The groundwater extraction system consists of approximately 770 lineal feet of interceptor trench in three sections and 985 lineal feet of cut-off wall. Located at the low point of the three sections of the interceptor trenches are three extraction wells. Each of the three extraction wells has a submersible pump in it. The pump discharge is tied to a force main that transfers the groundwater from the wells to an existing sanitary sewer which goes to the Butler County POTW for treatment. The pumps have three level controls, one for "pump on", one for "pump off", and one for high level "alarm". If a "pump on" signal is continuous for a predetermined amount of time, an alarm condition occurs. Each pump is connected to a run timer that records the run time.

All of the pumps operate independently. They are connected to a main control panel, which is located at the west end of the GIS. The panel contains run indicator lights for the pumps as well as depth of water in each extraction well with respect to the depth transducer. Additionally, the panel includes a telephone auto dialer that calls a minimum of four predetermined numbers in the event of an alarm situation. The auto dialer has prerecorded messages indicating the alarm

condition and location. The system is designed to be monitored remotely, without the need for routine operator interface. However, sampling of the effluent from the GIS is part of the discharge conditions required by BCDES Industrial Discharge Permit (see Attachment 3).

The pumps, valves, settings of the pump control and alarm, flow measurement device, and continuous sampler are the primary components requiring maintenance on the GIS. During the first six months of operation, the O&M tasks related to the GIS were performed on a monthly basis. After the first 6 months, the O&M activities are conducted on a quarterly basis.

The O&M plan provides for inspection and repair of the physical components of the site after closure. Maintenance activities for the final cap include mowing, earthwork activities to correct erosion and sedimentation problems, re-vegetation of disturbed or distressed areas, regrading in settlement areas as determined necessary, and localized repairs due to intrusion, vandalism, etc. The final cap is inspected quarterly for signs of damage. The O&M activities are planned to occur for 30 years after construction completion.

Operation, maintenance, and monitoring activities are performed by Earth Tech, a contractor for the PRP Group. In addition, Butler County has personnel performing activities associated with operation and maintenance.

The Long Term Performance Plan (LTPP) provides the mechanism to ensure that the RA meets the long-term performance standards set forth in the ROD. Sampling and chemical analysis of groundwater, surface water, and the measurement of groundwater elevations will occur as part of O&M activities following completion of the RA. A description of these field activities is provided below.

Groundwater Sampling Plan

The point of compliance for the downgradient groundwater control system is the line of monitoring wells between the GIS alignment and the East Fork of Mill Creek. Groundwater samples are collected from 11 monitoring wells located between the GIS and the East Fork of Mill Creek. The monitoring wells are sampled quarterly. The samples are analyzed for the parameters shown in Tables 7 and 8 (see Attachment 4). However, the PRPs may petition EPA and Ohio EPA to modify the parameter list and sampling frequency based on the results of groundwater monitoring conducted on a quarterly basis for two years after completion of the landfill cap and GIS. Three monitoring wells installed during the RI are located outside the fenced area. These wells are sampled and tested annually to monitor groundwater quality around the landfill. In addition, measurements of water levels and the presence or absence of DNAPLs will be recorded for all existing piezometers, monitoring wells and select gas probes. The measurements are used to evaluate the potentiometric surface and to monitor for DNAPLs in the vicinity of the landfill cap and GIS.

Surface Water Monitoring Plan

Surface water samples are collected for analysis from three monitoring points along the East Fork

of Mill Creek and three run-off outfall locations. Monitoring points were chosen to allow impacts from site run-off to be evaluated and include water entering the site upgradient of the landfill, points at and downstream of surface water discharges from the site, and water leaving the site. The samples are collected quarterly and will be analyzed for parameters found in Tables 7 and 8 (see Attachment 4). The PRPs may petition EPA and Ohio EPA to modify the parameter list and sampling frequency based on the results of groundwater monitoring conducted on a quarterly basis for two years after completion of the landfill cap and GIS.

Groundwater Waste Monitoring Plan (GWMP)

The purpose of this plan is to monitor the elevation of groundwater beneath the landfill cap area with respect to the maximum depth of buried waste. The GWMP provides a mechanism to evaluate whether waste material underneath the cap is in contact with site groundwater and whether the landfill cap is affecting the groundwater elevations beneath the landfill. The plan provides for quarterly measurements of the groundwater elevation and flow direction for two years (subsequent to the RA completion) or until the groundwater data have stabilized for at least four consecutive quarters, whichever is longer. The trigger date for the start of the two year monitoring period is September 30, 2003, which is the date EPA approved the RA construction completion report. The data derived from the quarterly sampling events is used to evaluate whether or not the waste material underneath the cap is in contact with site groundwater. The monitoring is implemented in conjunction with the quarterly groundwater sampling at the points of compliance to assess effectiveness of the GIS and the potential need to construct an upgradient groundwater control system.

If after two years of consecutive monitoring, EPA is not able to make a determination as to whether the elevation of the groundwater is below the waste material under the cap, quarterly monitoring will be conducted for an additional year. If EPA determines that the elevation of the groundwater is in contact with the waste material underneath the cap and may reasonably be expected to remain in contact with the waste material for more than three years after completion of the groundwater monitoring period, the PRP group will, within 60 days of EPA's determination or some other longer time period agreed to by EPA, submit to EPA a plan and schedule to construct the upgradient groundwater control. If the upgradient groundwater control plan is submitted, it will be incorporated in the O&M Plan. The points to be measured for the GWMP will be 12 piezometers, 15 monitoring wells, and 2 gas probes within and around the landfill cap.

The ROD estimated that the annual O&M costs will be $397,000. Since O&M activities are conducted by the PRPs, EPA does not have access to the actual expenditures.

Institutional Controls

The remedy includes institutional controls to limit the future use of all areas of the site where RA construction has occurred. These areas include the area covered by the cap, slurry wall, interceptor trenches, extraction wells, etc. The restrictions must prevent the use of this portion of the site for any activity which will interfere with the performance of the remedy, or which will

result in the exposure of contaminants to humans or the environment. Such restrictions include, but are not limited to, drilling, digging, building, or the installation, construction, removal, or use of any buildings, wells, pipes, roads, ditches, or any other structures on the capped area. EPA will need to prevent all individuals from traversing the cap, so that the cap is not damaged. In addition, deed restrictions need to be in place as a means to impose limitations on the use of the property. In the event that institutional controls cannot be implemented effectively, EPA and Ohio EPA will consider additional actions as necessary to ensure that the remedy remains effective on a long-term basis.

V. PROGRESS SINCE THE LAST FIVE-YEAR REVIEW

The remedy was implemented since the last five-year review.

VI. FIVE-YEAR REVIEW PROCESS

Administrative Components

Ohio EPA was notified of the initiation of the five-year review in January 2004. The Skinner Landfill Five-Year Review team was led by Scott Hansen of EPA, RPM for the site, and included the Ohio EPA (Chuck Mellon, Project Manager), Ron Roelker of Earth Tech, contractor for the PRP Group, and Ben Baker of Dow Chemical, representative of the PRP Group.

This five-year review consisted of the following activities: a review of relevant documents (see Attachment 2); interviews with local government officials; a local citizen and representatives of the construction and the operations contractors; and a site inspection. In addition, a notice regarding the forthcoming review was placed in the local newspaper. The completed report will be placed in the information repository. Notice of completion will be placed in the local newspaper which will include a summary of the Review findings.

Community Involvement

Activities to involve the community in the five-year review process were initiated in January 22, 2004 with a notification to the local newspaper for the Skinner Landfill Superfund site stating that a five-year review is being conducted at the site. The announcement publicized the start of the five-year review and invited citizens to get involved in the process.

Since the January 22, 2004, notice, no members of the community have expressed any interest or opinion concerning the five-year review process.

Document Review

This five-year review consisted of a review of relevant documents including O&M Plan, RA construction completion report, evaluation reports, and monitoring data (see Attachment 2). Site-specific groundwater trigger levels, as listed in the 1993 ROD, were reviewed.

Data Review

The O&M Plan was submitted by the PRPs in February 2002. Also, a Quality Assurance Project Plan for groundwater sampling was submitted at that time. After considerable review and discussions with the PRPs and their contractor, EPA accepted the plans in June 2003.

Prior to the start of the Long-term Performance activities (O&M), all of the site groundwater monitoring wells and surface water locations were sampled in March 2002. All of the samples were analyzed for metals, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, and PCBs. All monitoring wells, piezometers, and gas probes were in good condition, with no maintenance needed. No DNAPLs or LNAPLs were encountered in any of the wells or piezometers during the sampling event. The results are discussed below.

VOC and SVOC Results for Groundwater and Surface Water

Bis (2-ethylhexyl) phthalate was detected at 474 ug/L in groundwater at monitoring well GW-64, however it is qualified with a 'B' flag, indicating that the compound was detected in the method blank. This compound is known to be a common laboratory artifact.

VOCs were below detection limits in all surface water samples collected at the site. SVOCs were below detection limits in all surface water samples collected at the site, except for the field blank, which contained phenol at 14.9 ug/L.

Inorganic Results for Groundwater and Surface Water

Barium, Chromium, Copper, Iron, Lead, Nickel, Silver, Thallium and Zinc were detected in groundwater at various sampling locations, however, none of the detections exceeded the trigger levels. Barium, Copper, Iron, Lead, Nickel, Silver and Zinc were also detected in the method field blank. PCBs were not detected in any of the sampling locations.

Barium, Copper, Iron, Nickel, Silver and Zinc were detected in surface water at various sampling locations, however, none of the detections were above trigger levels. Iron, Silver, and Zinc were detected in the method field blank. PCBs were not detected at any of the locations. Cyanide was detected in the matrix spike sample at 109 ug/L, however, it was not seen in the original sample location and is most likely the result of a laboratory artifact.

Groundwater-Waste Monitoring Results

The groundwater elevations under the landfill cap indicate that groundwater levels have dropped below the buried waste at piezometers P-11 and P-12.

Conclusion

Of the twelve groundwater samples collected in March 2002, one trigger level exceedance was measured at MW-64. The exceedance at MW-64 is for bis (2-ethylhexyl) phthalate and is the

result of a laboratory artifact. The four surface water samples collected did not exhibit a trigger level exceedance.

As of February 2003, the GIS has pumped approximately 7,654,570 gallons and has resulted in a lowering of the groundwater table below the landfill such that groundwater is no longer in contact with the waste at two of the four monitoring locations.

Site Inspections

Site inspections took place in November 2001, March, June, and December 2002, March 2003 and January 2004. During the site inspections, the landfill cap was inspected and GIS was observed. The inspection evaluated the landfill cap, the GIS, the surface water drainage system, and site fencing.

The landfill cap was found to be in good condition. The vegetative cover was adequate and continuing to improve or mature, with no distressed areas, trees or shrubs. No noticeable depressions, excessive cracks, leachate seeps, odors, or other indications of distress were noted. No significant ponding has been observed on the cap. There was some evidence of erosion on the creek bank on the southeast side of the site. The erosion is not located on the landfill cap, therefore, it does not affect the performance or integrity of the cap system.

The 10.5-acre site is wire fenced on all sides with locked access gates on the west and southwest boundary. The wire fence needs repairs in some areas, particularly the southeastern boundary near the erosion area, and allows easy access to anyone wishing to walk on site. The PRP contractor is repairing the fence and erosion in the spring 2004. If the landfill cap is damaged, repairs are usually pursued in the spring or fall to enhance revegetation efforts. The PRP contractor is also making periodic checks for trespassers.

No other deficiencies of the cap system or appurtenant structures, including drainage channels and access roads, were noted. With the exception of the erosion to the creek bank no intrusive activities were noted on the cap system and no landfill waste or other contaminants were exposed or appeared likely to be exposed. The GIS was found to be operating and functioning properly. All monitoring well covers are intact and locked and show no signs of damage.

Interviews

The following individuals were contacted by telephone as part of the five-year review:

- Ron Roelker, Earth Tech, PRP contractor (Interviewed January 2004)
- Chuck Martin, local citizen, lives near the site (Interviewed November 2003)
- Chuck Mellon, Ohio EPA, project manager (Interviewed January 2004)
- Paula Wyrick, West Chester Township (Interviewed January 2004)

Mr. Roelker, Mr. Mellon, and Ms. Wyrick stated that there are no serious issues related to the site. They also stated that community interest about the site remains low. Ms. Wyrick stated that West Chester Township had received a copy the RA construction completion report. Mr. Martin called EPA to report possible activities at the site. EPA informed Mr. Roelker of the citizen's concern. Mr. Roelker conducted a site inspection and informed EPA that the site was not disturbed. Mr. Roelker confirmed that no changes in land use were planned for the site, and that institutional controls need to be implemented at the site.

VII. TECHNICAL ASSESSMENT

Question A: Is the remedy functioning as intended by the decision documents? Yes.

The review of documents, applicable or relevant and appropriate requirements (ARARs), risk assumptions, and the results of the site inspection indicates that the remedy is functioning as intended by the ROD. The cap has been completed, citizens are on public water supply and the GIS is in place, and these factors have achieved the remedial objectives to minimize the migration of contaminants to groundwater and surface water and prevent direct contact with, or ingestion of, contaminants in soils and sediments.

HASP/Contingency Plan: Both the HASP and the Contingency Plan are in place, sufficient to control risks, and properly implemented.

Implementation of Institutional Controls and Other Measures: The City provides security services for the site to prevent trespassing. The fence needs to be maintained. As previously discussed, the institutional controls have not been implemented. The institutional controls would include a restrictive easement which will prevent the use of the capped area of the site for any activity that interferes with the performance of the remedy, or which will result in the exposure of contaminants to humans or the environment. Such restrictions include, but are not limited to, drilling, digging, building, or the installation, construction, removal, or use of any buildings, wells, pipes, roads, ditches, or any other structures on the capped area. This issue needs to be resolved.

Remedial Action Performance: The landfill cap system has been effective in isolating waste and contaminants. As previously discussed, some erosion has occurred on the creek bank near the site but it does not affect the performance or integrity of the cap system. The GIS is intercepting and capturing groundwater. Groundwater monitoring shows that the landfill cap and GIS are functioning properly. These factors indicate that the remedial actions continue to be effective and operating and functioning as designed.

System Operations/O&M: System operations procedures are consistent with requirements.

Cost of System Operations/O&M: As previously discussed, the O&M activities are conducted by the PRPs, EPA does not have access to their actual expenditures.

Opportunities for Optimization: Given the adequate performance at the site, this five-year review does not identify a need for optimization at this time.

Early Indicators of Potential Remedy Failure: No early indicators of potential remedy failure were noted during the review.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid? Yes.

There have been no changes in the physical conditions of the Skinner Landfill site that would affect the protectiveness of the remedy.

Changes in Standards and To be Considers

As the remedial work has been completed, most ARARs for sediment, soil and debris contamination cited in the ROD have been met. There have been no changes in these ARARs and no new standards or "to be considered" (TBCs) requirements affecting the protectiveness of the remedy.

Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics

There have been no changes in the toxicity factors for the contaminants of concern that were used in the baseline risk assessment. These assumptions are considered to be conservative and reasonable in evaluating risk and developing risk-based cleanup levels. No change to these assumptions, or the cleanup levels developed from them is warranted. There has been no change to the standardized risk assessment methodology that could affect the protectiveness of the remedy. The remedy is progressing as expected.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy? No.

No other events have affected the protectiveness of the remedy and there is no other information that calls into question the short term and long term protectiveness of the remedy.

Technical Assessment Summary

According to the data reviewed and the site inspections, the remedy is functioning as intended by the ROD. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. ARARs for soil, groundwater and sediment contamination cited in the ROD have been met. There have been no changes in the toxicity factors for the contaminants of concern that were used in the baseline risk assessment, and there have been no changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. There is no other information available that calls into question the protectiveness of the remedy.

VIII. ISSUES

The primary operation performed at the site is the removal of groundwater to the Butler County sewer system. As mentioned before, the pumps, valves, settings for the pump control and alarm, flow measurement device, and continuous sampler are the primary GIS components requiring maintenance. During scheduled O&M maintenance activities, the PRP contractor will need to ensure that all the components of the GIS system are functioning properly. All general O&M maintenance will be conducted for the next 30 years.

The O&M plan provides for quarterly measurements of the groundwater elevation and flow direction for two years (subsequent to the RA completion of September 2003) or until the groundwater data have stabilized for at least four consecutive quarters, whichever is longer. The data derived from the quarterly sampling events, will be used to evaluate whether or not the waste material underneath the cap is in contact with site groundwater. If after two years of consecutive monitoring (September 2005), EPA is not able to make a determination as to whether the elevation of the groundwater is below the waste material under the cap, quarterly monitoring will be conducted for an additional year. If EPA determines that the elevation of the groundwater is in contact with the waste material underneath the cap and may reasonably be expected to remain in contact with the waste material for more than three years after completion of the groundwater monitoring period, the PRP group will, within 60 days of EPA's determination or some other longer time period agreed to by EPA, submit to EPA a plan and schedule to construct the upgradient groundwater control. The monitoring will be implemented in conjunction with the quarterly groundwater sampling at the points of compliance to assess effectiveness of the GIS and the potential need to construct an upgradient groundwater control system.

In addition, the institutional controls need to be implemented at the site. The institutional controls may include a restrictive easement or some other type of proprietary control, which will prevent the use of the capped area of the site for any activity that interferes with the performance of the remedy, or which will result in the exposure of contaminants to humans or the environment. Such restrictions include, but are not limited to, drilling, digging, building, or the installation, construction, removal, or use of any buildings, wells, pipes, roads, ditches, or any other structures on the capped area.

Table 2 - Issues

Issue	Currently Affects Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Institutional Controls - Not implemented	N	Y
Creek bank has eroded	N	Y

Issue	Currently Affects Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Site fence missing at creek bank erosion area	N	Y
Water accumulating in Vault Box and Inspection Manhole	N	Y
Upgradient groundwater control	N	Y
Security Measures required	N	Y

IX. RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Table 3 - Recommendations and Follow-Up Actions

Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
					Current	Future
Institutional Controls	Need to be implemented	PRP Group and EPA	EPA	ASAP	N	Y
Creek bank erosion	Install gabion wall	PRP Group	EPA	Spring 2004	N	Y
Site fence missing at eroded creek bank	Install site fence after creek bank stabilization	PRP Group	EPA	Spring 2004	N	Y
Water accumulation in Vault Box and Inspection Manhole	Water will be pumped out periodically	PRP Group	EPA	As needed	N	Y

Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
					Current	Future
Upgradient groundwater control	Quarterly measurements of groundwater elevations	PRP Group	EPA	Fall 2005	N	Y
Security Measures	Repair fence where needed and put up more warning signs where trespassing is likely to occur.	PRP Group	EPA	Next 30 years	N	Y

It is recommended that inspections be performed after extreme meteorological events, such as tornados or extreme rainfall, to ensure the integrity of the access road or cap has not been compromised. The site fencing, gates, and the existing control panel will be inspected at the same frequency as the cap system, at least 3-4 times a year. Repairs should be performed when determined through inspection.

The passive landfill gas management system consists of vent pipes located throughout the area of final cap system installation. These vents will be inspected at the same frequency and duration as the cap system.

X. PROTECTIVENESS STATEMENT

The remedy is protective of human health and the environment in the short term. There are no current exposure pathways and the remedy appears to be functioning as designed. The landfill cap, the GIS, public water supply for nearby residents and groundwater monitoring have achieved the remedial objectives to minimize the migration of contaminants to groundwater and surface water and prevent direct contact with, or ingestion of, contaminants in soils and sediments.

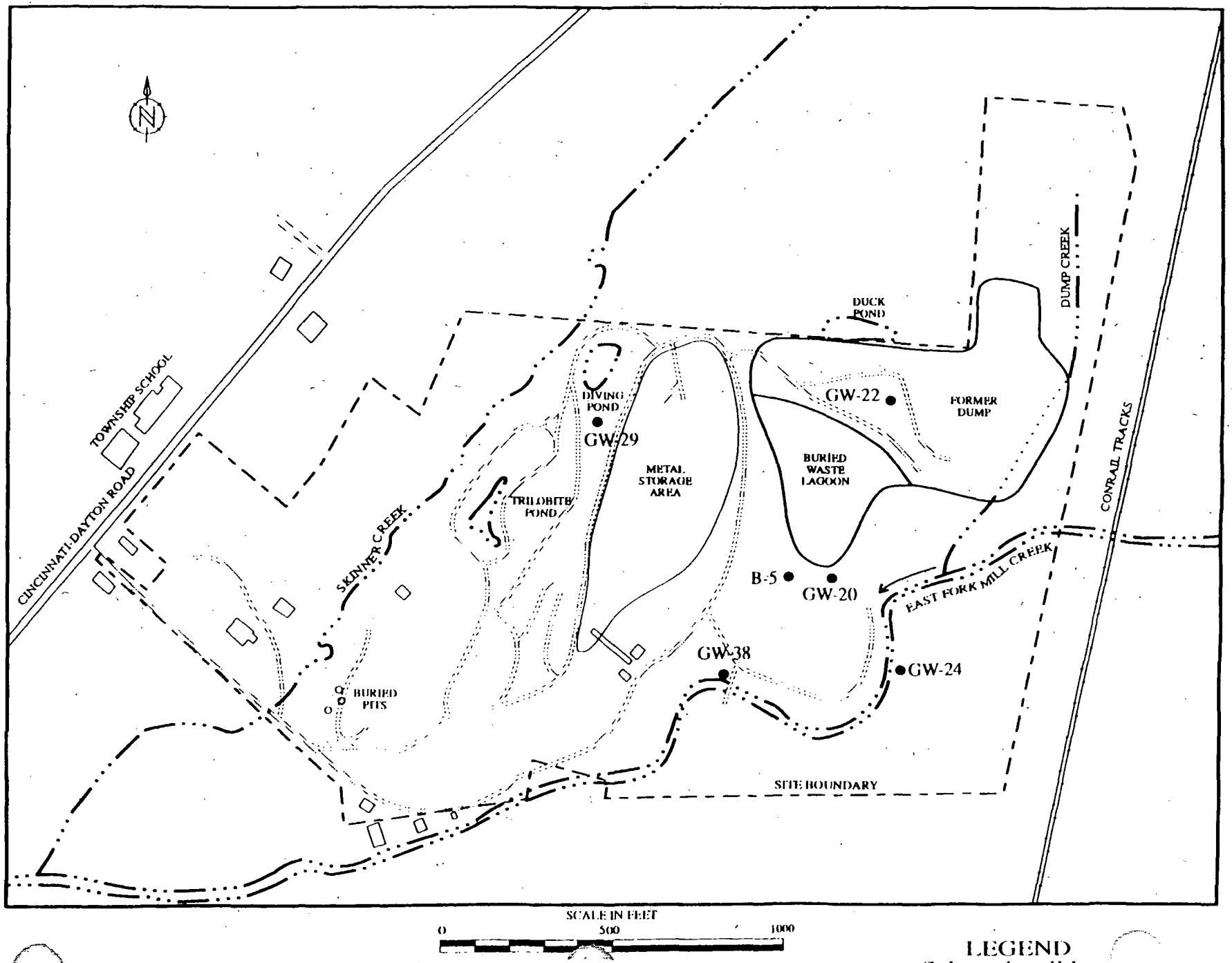
Long-term protectiveness of the remedial action will be achieved when cleanup goals are met.

XI. NEXT REVIEW

The next five-year review for the Skinner Landfill site is required by March 2009, five years from the date of this review.

ATTACHMENTS

Attachment 1: Skinner Site Map



ATTACHMENT 2

List of Documents Reviewed

- Final Operation and Maintenance - Long Term Performance Plan
- Final Remedial Construction Completion Report
- CERCLA - Record of Decision
- Results of Groundwater Monitoring 2002

ATTACHMENT 3

Butler County Department of Environmental Services

Water • Wastewater • Solid Waste • Recycling & Litter Prevention

Commissioners:
Courtney E. Combs
Charles R. Furmon
Michael A. Fox

SPECIAL WASTEWATER DISCHARGE PERMIT

March 17, 2003

The Skinner Landfill Site Work Group
c/o The Dow Chemical Company
Attn: Ben Baker
Remediation Leader
The Dow Chemical Company
4520 E. Ashman
Midland, MI 48674

Re: Skinner Landfill Consent Decree
Permit # 150-01
Permit Fee $200.00
Effective Date: 3/11/2003
Expiration Date: 9/30/2003

In accordance with the provisions of the agreement reached with Butler County Department of Environmental Services (hereafter "BCDES") in May 1996, this Special Wastewater Discharge Permit is hereby granted to The Skinner Landfill Site Work Group, c/o The Dow Chemical Company Attn: Ben Baker Remediation Leader 4520 E. Ashman Midland, Michigan 48674 (hereafter called "Permittee") on this 17th day of March, 2003. **This permit supersedes the permit originally issued on 03/11/2003, and is retroactive to 03/11/2003.** Permittee is authorized to discharge into the Butler County Sewer System in a manner approved by BCDES under the following conditions of this draft permit:

BCDES has agreed to accept the groundwater discharge from Skinner Landfill Site, only based on the understanding that a Special Discharge Permit would be issued by BCDES with site-specific conditions for connection, monitoring, compliance, and user fees. BCDES proposes to handle this discharge in a unique way because (a) groundwater is a

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prohibited discharge according to the BCDES Sewer Use Rules (hereafter "Rules"), (b) the pollutant concentrations and flows may fluctuate and (c) there is no control or pretreatment system in place. This Draft Special Discharge Permit will be subject to a 14 day public notification process prior to consideration by the Butler County Board of Commissioners.

The permit shall contain special conditions of the discharge and shall expire on September 30, 2003. Subsequent permits shall be effective for up to five (5) years. BCDES will use the sampling vault to collect flow proportional samples. Grab samples will be obtained from the next downstream manhole from the sampling vault. The discharge will have a flow monitoring system. BCDES requires all dischargers to execute a flow monitoring agreement and have an effective O&M and calibration program in place so that BCDES is assured reliable flow data.

The monthly usage fee shall be established at 200% of the standard discharge fee/1000 gallons based on the potentially hazardous content of the waste.

Except as provided in this Special Permit, Permittee shall at all times remain subject to all provisions of the Rules. This Permit does not constitute a waiver by BCDES or the Board of County Commissioners of the right to seek any lawful remedy or penalty for any such violation of this Permit or Rules.

Section 9.6A of the Rules provides that any person who violates a permit condition is subject to a civil penalty in an amount not to exceed $10,000.00 per day of such violation (Section 9.6A). Consequently, should Permittee violate this Special Wastewater Discharge Permit or any Rule, the County, acting through its Director of BCDES, shall have the authority to assess civil penalties of up to $10,000.00 per violation per day. A violation of this permit is subject to such penalties as may be provided by law.

In addition to civil and criminal liability, the Permittee violating this permit, or causing damage to or otherwise materially inhibiting the Upper Mill Creek wastewater disposal system shall be liable to the BCDES for any expense, loss, or damage caused by such violation or discharge. The BCDES shall bill the Permittee for the costs incurred by the BCDES for any cleaning, repair, or replacement work caused by the violation or discharge. Refusal to pay the assessed costs shall constitute a separate violation of Section 9.6B of the Rules.

This permit may be modified by agreement of the Permittee and BCDES in accordance with provisions of the Rules or as lawfully required by the United States EPA, Ohio EPA or agencies thereof. Should BCDES and Permittee be unable to come to terms on a modification of this Permit, BCDES may cancel any remaining term of this Permit upon 180 days notice to Permittee.

Failure on the part of the Permittee to fulfill any of the specified conditions may be sufficient cause for immediate revocation of this permit per Section 5.7 of the Rules. This permit is further subject to termination upon thirty (30) days written notice to the Permittee by an authorized representative of BCDES.

It is the responsibility of the Permittee to submit to an Application for Special Wastewater Discharge Permit to BCDES at least ninety (90) days prior to the expiration date of this permit.

This permit may be assigned or transferred to another discharger per provisions of Section 5.6 of the Rules, which require approval of the Director. Such assignment will not be unreasonably withheld. Notice of changes in the point of discharge, in the number or location of extraction points or other changes that may impact the quality or quantity of the effluent must be provided to and acceptable to BCDES per Section 6.5 of the Rules.

Incidental discharges resultant from monitoring, and/or operation and maintenance of the Skinner Landfill Site as of the effective date of the Special Permit Issuance may be accepted upon notification to BCDES per the Rules.

James A. Parrott
Director

SPECIAL PERMIT CONDITIONS

1) Except as otherwise provided in this Special Permit, the Permittee shall comply with the Rules and with the U.S. v Skinner Consent Decree. Where inconsistency exists between the Rules and the Consent Decree, an understanding shall be reached between BCDES and Permittee, with court approval where necessary, as to the terms of this Special Permit before discharges are accepted. In the event of a dispute between the Permittee and BCDES after the Permit is granted, the parties agree to attempt to resolve the dispute first through mediation using a mediator acceptable to both parties, and including U.S. EPA in the mediation if requested by the Permittee.

2) The Permittee shall allow BCDES personnel, upon presentation of their credentials or other documents as may be required by law, to: enter the Skinner Site premises and have access to, inspect, and copy, at reasonable times, any records located at any facility that are deemed necessary by such personnel to determine Permittee's compliance with this Permit. Permittee shall have the right to claim business confidentiality, trade secret, or privileges recognized by state or federal law on the face of any document sought to be copied by BCDES personnel. Should any other person attempt, under the Ohio Public Records Law, to obtain a copy of material from BCDES which Permittee claims to be protected from disclosure, BCDES shall notify Permittee of the request and allow Permittee to defend its claim of entitlement to exclusion before a judge of the Butler County Court of Common Pleas and no material shall be released except in accordance with the final ruling of an Ohio court upon the question. The Permittee shall allow BCDES personnel to inspect at reasonable times any facilities, equipment, practices, or operations regulated or required under this permit; BCDES may sample or monitor, for the purposes of assuring permit compliance, any relevant substances or parameters at any location; and inspect any storage area where pollutants, regulated under this permit, could originate, be stored, or be discharged to the sewer system. Should BCDES be denied access to records it seeks to determine compliance with the terms and conditions of this Permit, then a responsible official of the Permittee shall provide BCDES with an affidavit attesting to Permittee's full and complete compliance with the terms of this Permit under penalty of perjury. Should BCDES be denied access to information it seeks or be denied an acceptable affidavit in lieu of access, BCDES may terminate this Permit upon thirty (30) days prior notice to Permittee.

3) BCDES will conduct regular discharge monitoring to determine that constituents in the effluent from Skinner Landfill Site do not exceed local limits or site-specific limits or pose a threat to the wastewater treatment facility, the collection system, County employees or the receiving stream. The inorganic and organic discharges shall not be in excess of local or site specific limits (see attached maximum discharge limit chart). Should sampling indicate violations of these limits, BCDES reserves the right to suspend the discharge and/or require pretreatment prior to accepting additional flow.

4) Due to the nature and source of the discharge, BCDES will aggressively monitor local limit parameters until the County feels that it has representative data, at which time a normal schedule may be adopted of monthly local limits monitoring. However, BCDES has the right to sample, with or without notice, as frequently as it determines necessary. The costs associated with sampling will be billed back to the discharger along with any surcharge fees associated with high strength acceptable waste. Any prohibited waste in excess of site specific limits will be subject to the enforcement provisions of the Rules and the Enforcement Response Plan. BCDES understands that seasonal variations may have an impact on water quality parameters, and we want to be assured that the concentrations we are given are within the Publicly Owned Treatment Works (POTW's) ability to safely handle.

5) The Permittee shall report to the BCDES any significant changes in location, operational conditions, the quality or quantity of discharges or chemical storage procedures as provided in Section 6.5 of the Rules.

6) The Permittee shall notify the BCDES immediately after Permittee's knowledge of the occurrence of an accidental discharge of substances or slug loads or spills that may enter the public sewer. BCDES should be notified by telephone at (513) 887-3686.

The notification shall include location of discharge, date and time thereof, type of waste, including concentration and estimated volume, and corrective actions taken (Section 6.6A). The Permittee's notification of accidental releases in accordance with this section does not relieve it of other reporting requirements that arise under local, State, or Federal laws or the U.S. v Skinner Consent Decree.

Within 5 days of the verbal notification of a discharge, a complete written report must be submitted detailing the quantity and quality of discharge, reason for discharge, and steps taken to prevent further occurrences.

7) The Permittee shall keep on file at a location of Permittee's choosing, all records, documents, reports, and correspondence pertaining to effluent monitoring, sampling, and chemical analysis made by or prepared for the Permittee. Said records, reports, documents and correspondence shall be kept on file for a minimum of three (3) years.

8) Particular attention should be given to the following: (Note: This section will be utilized to reflect the categorical standards and limits (40 CFR 433) if applicable).

(a) From effective date of the permit through September 30, 2003, the Permittee's effluent wastewater discharged to the County Sewer System shall not exceed the following limits based on flow rates provided in the application.

BCDES Special Permit Limits for Skinner Landfill Site

Skinner Landfill Applicable Parameters	Applicable Limit	Allowable Mass Loading Limits[1] (lbs/day)
TTO	Site Specific	0.53
Arsenic	Local Limit	0.04
Cadmium	Local Limit	0.02
Chromium, Total	Local Limit	0.88
Chromium, Hexavalent	Local Limit	0.13
Copper	Local Limit	0.35
Lead	Local Limit	0.13
Mercury	Local Limit	<0.00009
Molybdenum	Local Limit	0.17
Nickel	Local Limit	0.31
Selenium	Local Limit	0.03
Silver	Local Limit	0.01
Cyanide, Total	Local Limit	0.03
Zinc	Local Limit	0.25
Ammonia	Local Limit	9.17
BOD_5	Local Limit	366.96
COD	Local Limit	917.40
Oil & Grease	Local Limit	18.35
TSS	Local Limit	229.35

(1) Based upon 11,000 gallons per day discharge rate. The method detection limit (MDL) for mercury is 0.2 ug/l. Ohio EPA defined practical quantification limit (PQL) is 5 times the MDL. To determine compliance with this permit, results below the mdl will be reported as BDL. Results between the MDL and the PQL shall be reported as an analytical result.

9) The conditions for renewal of the permit will be that 90 days prior to expiration of the permit, the Permittee shall provide a analysis of the discharge, including operational schedule and anticipated flows, concentrations and an evaluation of the discharge needs for the following 4 years. Additionally, any anticipated significant operational changes shall be reported at any time there is an anticipated significant change during the course of the agreement.

10) The Permittee must verbally notify BCDES within 24 hours of becoming aware of any violation found in any self-monitoring. BCDES will require the Permittee to re-sample every 30 days until the Permittee's discharge is in compliance with limits established in this permit. In addition, the Permittee must submit all effluent and monitoring well data collected in accordance with the self-monitoring requirements in 40 CFR Part 136 (as applicable) or the analytical requirements approved by U.S. EPA pursuant to the U.S. v. Skinner Consent Decree, as appropriate. This includes any samples the County may split with the Permittee.

11) This permit allows discharge of up to 324,000 gallons per month from the Skinner Landfill Site. Flows greater than 324,000 gallons per month will be assessed peaking surcharges as established in the County's Sewer Rate Resolution 02-1-103, or any subsequent rate schedule. Additionally, due to the nature of this special discharge, any peaking charges are subject to be billed at the 200% standard discharge fee that is established this Special Permit.

Should additional flow need to be discharged from the Skinner Landfill Site, then a letter requesting allocation of additional capacity will need to be sent to the Director. Since groundwater is a prohibited flow except as provided by this Special Permit, then separate approval and agreement will be needed regarding additional ERU allocation.

12) BCDES may make an additional 23 ERUs ("Additional ERU") available for Permitee's use with the understanding that the charges for the 23 ERUs will be paid by Permittee at the rate currently in effect at the time of purchase. It is also required that Permittee will surrender to BCDES one or more Additional ERU(s) assigned to Permittee when the groundwater flow from the Skinner Landfill Site decreases such that each Additional ERU/capacity allocation is no longer needed by Permittee. An Additional ERU will be deemed to be no longer needed after a period of two (2) years in which the peak flow in any one month does not exceed 110% of the additional assigned capacity. For example, if the peak monthly flow in 2004 is 450,000 gallons, then each Additional ERU in excess of that needed for the 495,000 gallon capacity allocation would be considered to be an Additional ERU to be surrendered in 2006. For the purposes of determining the surrender of an Additional ERU, a review will be conducted by BCDES and Permittee in January of each year with a surrender of an Additional ERU, if any, to occur in January two (2) years later. Should data during the intervening two (2) years indicate Permittee's need for the Additional ERU, then a letter requesting deferral of the surrender will be submitted to BCDES. Consent for such deferral will not be unreasonably withheld by BCDES. Notwithstanding the ERU review example provided above, at no time shall the Additional ERU review require the Skinner Landfill Site to surrender any of the original 27 ERUs (324,000 gallons per month) authorized under this permit.

ATTACHMENT 4

TABLE 7

TARGET COMPOUND LIST

		Quantitation Limits (1)
Volatiles	CAS Number	Water (ug/L)
1. Chloromethane	74-87-3	1.0
2. Bromomethane	74-83-9	1.0
3. Vinyl Chloride	75-01-4	1.0
4. Chloroethane	75-00-3	1.0
5. Methylene Chloride	75-09-2	1.0
6. Acetone	67-64-1	1.0
7. Carbon Disulfide	75-15-0	1.0
8. 1,1-Dichloroethene	75-35-4	1.0
9. 1,1-Dichloroethane	75-35-3	1.0
10. 1,2-Dichloroethane (total)	540-59-0	1.0
11. Chloroform	67-66-3	1.0
12. 1,2-Dichloroethane	107-06-2	1.0
13. 2-Butanone	78-93-3	1.0
14. 1,1,1-Trichloroethane	71-55-6	1.0
15. Carbon Tetrachloride	56-23-5	1.0
16. Bromodichloromethane	75-27-4	1.0
17. 1,2-Dichloropropane	78-87-5	1.0
18. cis-1,3-Dichloropropene	10061-01-5	1.0
19. Trichloroethene	79-01-6	1.0
20. Dibromochloromethane	124-48-1	1.0
21. 1,1,2-Trichloroethane	79-00-5	1.0
22. Benzene	71-43-2	1.0
23. trans-1,3-Dichloropropene	10061-02-6	1.0
24. Bromoform	75-25-2	1.0
25. 4-Methyl-2-pentanone	108-10-1	1.0
26. 2-Hexanone	591-78-6	1.0
27. Tetrachloroethene	127-18-4	1.0
28. Toluene	108-88-3	1.0
29. 1,1,2,2-Tetrachloroethane	79-34-5	1.0
30. Chlorobenzene	108-90-7	1.0
31. Ethyl benzene	100-41-4	1.0
32. Styrene	100-42-5	1.0
33. Xylenes (total)	1330-20-7	1.0

TABLE 7 (cont.)

TARGET COMPOUND LIST

Semi-volatiles (2, 3)	CAS Number	Quantitation Limits (1)	
		Water (ug/L)	Soil/Sediment (mg/kg)
34. Phenol	108-95-2	10	330
35. bis(2-Chloroethyl) ether	111-44-4	10	330
36. 2-Chlorophenol	95-57-8	10	330
37. 1,3-Dichlorobenzene	541-73-1	10	330
38. 1,4-Dichlorobenzene	106-46-7	10	330
39. 1,2-Dichlorobenzene	95-50-1	10	330
40. 2-Methylphenol	95-48-7	10	330
41. 2,2'-oxybis-(1-Chlororpropane)#	108-60-1	10	330
42. 4-Methylphenol	106-44-5	10	330
43. N-Nitroso-di-n-dipropylamine	621-64-7	10	330
44. Hexachloroethane	67-72-1	10	330
45. Nitrobenzene	98-95-3	10	330
46. Isophorone	78-59-1	10	330
47. 2-Nitrophenol	88-75-5	10	330
48. 2,4-Dimethylphenol	105-67-9	10	333
49. bis(2-Chloroethoxy) methane	111-91-1	10	330
50. 2,4-Dichlorophenol	120-83-2	10	330
51. 1,2,4-Trichlorobenzene	120-82-1	10	330
52. Naphthalene	91-20-3	10	330
53. 4-Chloroaniline	106-47-8	10	330
54. Hexachlorobutadiene	87-68-3	10	330
55. 4-Chloro-3-methyphenol	59-50-7	10	330
56. 2-Methylynaphthalene	91-57-6	10	330
57. Hexachlorocyclopentadiene	77-47-4	10	330
58. 2,4,6-Trichlorophenol	88-06-2	10	330
59. 2,4,5-Trichlorophenol	95-95-4	25	800
60. 2-Chloronaphthalene	91-58-7	10	330
61. 2-Nitroaniline	88-74-4	25	800
62. Dimethylphthalate	131-11-3	10	330
63. Acenaphthlene	208-96-8	10	330
64. 2,6-Dinitrotoluene	606-20-2	10	330
65. 3-Nitroaniline	99-09-2	50	800
66. Acenaphthene	83-32-9	10	330
67. 2,4-Dinitrophenol	51-28-5	25	800
68. 4-Nitrophenol	100-02-7	25	800
69. Dibenzofuran	132-64-9	10	330
70. 2,4-Dinitrotoluene	121-14-2	10	330
71. Diethylphthalate	84-66-2	10	330
72. 4-Chlorophenyl-phenyl ether	7005-72-3	10	330
73. Fluorene	86-73-7	10	330

TABLE 7 – (Cont.)

TARGET COMPOUND LIST

Semi-volatiles (2, 3)	CAS Number	Quantitation Limits (1)	
		Water (ug/L)	Soil/Sediment (mg/kg)
74. 4-Nitroaniline	100-01-6	25	800
75. 4,6-Dinitro-2-methylphenol	534-52-1	25	800
76. N-Nitrosodiphenylamine	86-30-6	10	330
77. 4-Bromophenyl-phenyl ether	101-55-3	10	330
78. Hexachlorobenzene	118-74-1	10	330
79. Pentachlorophenol	87-86-5	25	800
80. Phenanthrene	85-01-8	10	330
81. Anthracene	120-12-7	10	330
82. Carbazole	86-74-8	10	330
83. Di-n-butyl phthalate	86-74-2	10	330
84. Fluoranthene	206-44-0	10	330
85. Pyrene	129-00-0	10	330
86. Butyl benzyl phthalate	85-68-7	10	330
87. 3,3'-Dichlorobenzidine	91-94-1	10	330
88. Benz(a)anthracene	56-55-3	10	333
89. Chrysene	218-01-9	10	330
90. bis(2-Ethylhexyl)phthalate	117-81-7	10	330
91. Di-n-Octylphthalate	117-84-0	10	330
92. Benzo(b)fluoranthene	205-99-2	10	330
93. Benzo(k)fluoranthene	207-08-9	10	330
94. Benzo(a)pyrene	50-32-8	10	330
95. Indeno(1,2,3-cd)pyrene	193-39-5	10	330
96. Dibenzo(a,h)anthracene	53-70-3	10	330
97. Benzo(g,h,i)perylene	191-24-2	10	330

Previously known by the name bis(2-Chloroisopropyl) ether

(1) Quantitation Limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis, as required by the protocol, will be higher.

TABLE 7 (cont.)

TARGET COMPOUND LIST

Pesticides/Aroclors	CAS Number	Quantitation Limits (1)	
		Water (ug/L)	Soil/Sediment (mg/kg)
98. alpha-BHC	319-84-6	0.05	1.7
99. beta-BHC	319-85-7	0.05	1.7
100. delta-BHC	319-86-8	0.05	1.7
101. gamma-BHC (Lindane)	58-89-9	0.05	1.7
102. Heptachlor	76-44-8	0.05	1.7
103. Aldrin	309-00-2	0.05	1.7
104. Heptachlor epoxide	1024-57-3	0.05	1.7
105. Endosulfan I	959-98-8	0.05	1.7
106. Dieldrin	60-57-1	0.10	3.3
107. 4,4'-DDE	72-55-9	0.10	3.3
108. Endrin	72-20-8	0.10	3.3
109. Endosulfan II	33213-65-9	0.10	3.3
110. 4,4'-DDD	72-54-8	0.10	3.3
111. Endosulfan sulfate	1031-07-8	0.10	3.3
112. 4,4'-DDT	50-29-3	0.10	3.3
113. Methoxychlor	72-43-5	0.50	17.0
114. Endrin ketone	53494-70-5	0.10	3.3
115. Endrin aldehyde	7421-36-3	0.10	3.3
116. alpha-Chlordane	5103-71-9	0.05	1.7
117. gamma-Chlordane	5103-74-2	0.05	1.7
118. Toxaphene	8001-35-2	5.0	170.0
119. AROCLOR-1016	12674-11-2	1.0	33.0
120. AROCLOR-1221	11104-28-2	0.5	67.0
121. AROCLOR-1232	11141-16-5	0.5	33.0
122. AROCLOR-1242	53469-21-9	1.0	33.0
123. AROCLOR-1248	12672-29-6	1.0	33.0
124. AROCLOR-1254	11097-69-1	1.0	33.0
125. AROCLOR-1260	11096-82-5	1.0	33.0

(1) Quantitation Limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis, as required by the protocol, will be higher.

TABLE 8

TARGET ANALYTE LIST

Analyte	Contract Required (1, 2, 3) Detection Limit (ug/L)
Aluminum	200
Antimony	60
Arsenic	10
Barium	200
Beryllium	5
Cadmium	5
Calcium	5000
Chromium	10
Cobalt	50
Copper	25
Iron	100
Lead	3
Magnesium	5000
Manganese	15
Mercury	0.2
Nickel	40
Potassium	5000
Selenium	5
Silver	10
Sodium	5000
Thallium	10
Vanadium	50
Zinc	20
Cyanide	10

(1) Higher detection limits may only be used if the sample concentration exceeds five times the detection limit of the instrument or method in use. The value may be reported even though the instrument or method detection limit may not equal the CRQL. This is illustrated in the example where the value of 220 may be reported even though the instrument detection limit is greater than the CRQL.

For lead:

Method in use = ICP
Instrument Detection Limit (IDL) = 40
Sample Concentration = 220
CRQL = 3

(2) The CRQLs are the instrument detection limits obtained in pure water. The detection limits for samples may be considerably higher depending on the sample matrix.

(3) The CRQLs for soils = 200 times CRQL's for water.